Please amend the claims to read as follows.

Please replace claim 1 with the following amended version thereof to incorporate the revisions set forth on the accompanying mark-up page:

1. (Four Times Amended) A routing system for distributing packets in a network, wherein the packets originate at a source and are routed to a destination, comprising:

a plurality of route processing engines;

a mechanism that performs a hashing function on at least a portion of network layer information in the packets transferred to the routing system, to produce an indicia of a flow and,

means for switching packets with a same said indicia of a flow to a single route processing engine.

Please replace claim 2 with the following amended version thereof to incorporate the revisions set forth on the accompanying mark-up page:

2. (Thrice Amended) The routing system of claim 1, further comprising:

at least one fast uplink connection to an external network to accept outgoing packets from a plurality of processing engines.

Please replace claim 3 with the following amended version thereof to incorporate the revisions set forth on the accompanying mark-up page:

3. (Amended) The routing system of claim 1, further comprising:

a crossbar as said means for switching packets.

Please replace claim 9 with the following amended version thereof to incorporate the revisions set forth on the accompanying mark-up page:

9. (Amended) The routing system of claim 1, further comprising:

means for scaling processing power of said system by adding additional route processing engines to said plurality of route processing engines.

Please replace claim 11 with the following amended version thereof to incorporate the revisions set forth on the accompanying mark-up page:

11. (Thrice Amended) A router for distributing packets in a network, wherein the packets originate at a source and are routed to a destination, comprising:

a plurality of network interfaces that transfer the packets to a destination and from a source;

a plurality of route processing engines;

a fabric interconnecting said plurality of network interfaces and said plurality of route processing engines;

a hashing function to determine a distribution of the packets, by said fabric in response to an output of said hashing function, among said plurality of route processing engines.

Please replace claim 12 with the following amended version thereof to incorporate the revisions set forth on the accompanying mark-up page:

12. (Amended) The routing system of claim 11, further comprising:

said fabric includes a crossbar.

Please replace claim 15 with the following amended version thereof to incorporate the revisions set forth on the accompanying mark-up page:

15. (Amended) The routing system of claim 11, further comprising:

a port adapter, wherein the port adapter converts input data to a desired interface.

Please replace claim 16 with the following amended version thereof to incorporate the revisions set forth on the accompanying mark-up page:

16. (Amended) The routing system of claim 15, wherein said network interfaces include at least one uplink connection to an external network, wherein the port adapter converts input data to a known interface.

Please replace claim 17 with the following amended version thereof to incorporate the revisions set forth on the accompanying mark-up page:

Sub F3 Cont E4

17. (Amended) A method, in a router, for selecting one processing engine of a plurality of processing engines for processing at least one packet, the method comprising the steps of:

hashing at least a portion of network layer information of at least one packet to determine a hash result, said hash result indicating a flow;

selecting one processing engine to process the flow indicated by said hash result.

Please replace claim 18 with the following amended version thereof to incorporate the revisions set forth on the accompanying mark-up page:

Sub I'

18. (Amended) The method of claim 17, further comprising:

the network layer information comprises one or more of the following network information: a network source address of the at least one packet, a network destination address of the at least one packet , a network destination address of the at least one packet, a source port of the at least one packet, and a protocol type value of the at least one packet.

Please replace claim 20 with the following amended version thereof to incorporate the revisions set forth on the accompanying mark-up page:

Sub I' E5

20. (Amended) The method of claim 17, further comprising:

the hashing is computed by logically XORing an addresses, a port, and a protocol type value.

Please replace claim 21 with the following amended version thereof to incorporate the revisions set forth on the accompanying mark-up page:

21. (Amended) The method of claim 17, further comprising:

providing a table containing entries for use in selecting the one processing engine;

selecting one entry in the table specified by an index value, the index value based upon the hash value to select the processing engine for the hash value.

Please replace claim 23 with the following amended version thereof to incorporate the revisions set forth on the accompanying mark-up page:

23. (Amended) The method of claim 17, further comprising:

distributing, in response to the hash function, the packets evenly among the plurality of processing engines.

Please replace claim 26 with the following amended version thereof to incorporate the revisions set forth on the accompanying mark-up page:

26. (Amended) A system, in a router, for selecting one processing engine of a plurality of processing engines for processing at least one packet, the system comprising:

means for examining at least a portion of network layer flow information of the at least one packet; and

means, responsive to said at least a portion of network layer flow information, for selecting the one processing engine to preserve a packet flow indicated by the at least a portion of network layer flow information.

Please replace claim 27 with the following amended version thereof to incorporate the revisions set forth on the accompanying mark-up page:

27. (Amended) The system of claim 26 wherein the network layer flow information comprises:

CONT E7

at least one of a network source address of the at least one packet, a network destination address of the at least one packet, a source port of the at least one packet, a destination address of the at least one packet, and a protocol type value of the at least one packet.

Please replace claim 29 with the following amended version thereof to incorporate the revisions set forth on the accompanying mark-up page:

SUB I'

29. (Amended) The system of claim 26, further comprising:

the hash value is computed by logically XORing the addresses, the ports, and the protocol type value.

Please replace claim 30 with the following amended version thereof to incorporate the revisions set forth on the accompanying mark-up page:

E8

30. (Amended) The system of claim 26 further comprising:

means for providing a table containing entries for use in selecting the one processing engine; and

means, responsive to the hash value, for selecting one entry in the table.

Please replace claim 31 with the following amended version thereof to incorporate the revisions set forth on the accompanying mark-up page:

31. (Amended) The system of claim 26, further comprising:

the means for selecting carries out a hashing function that preserves the packet flow.

Please replace claim 32 with the following amended version thereof to incorporate the revisions set forth on the accompanying mark-up page:

32. (Amended) The system of claim 26, further comprising:

cont E8

the at least one packet is one of a plurality of packets, and the means for selecting carries out a hashing function that causes the packets to be mostly evenly distributed among the processing engines.

Please replace claim 44 with the following amended version thereof to incorporate the revisions set forth on the accompanying mark-up page:

sub G5

44. (Amended) A routing system for distributing packets in a network, wherein the packets originate at a source and are routed to a destination, both source and destination external with respect to the routing system, comprising:

a plurality of network interfaces that transfer packets to said destination and from said source;

E9

a plurality of route processing engines;

a hash mechanism that performs a hashing function on at least a portion of network layer information of a particular packet, in the packets transferred to the routing system, to determine an approximately even distribution of the packets to the route processing engines for processing by the engines, and said hash mechanism producing a hash result giving an indication of a flow of said particular packet so that packets of a flow are switched to the same route processing engine of said plurality of route processing engines.

Please add new claims 45 *et seq.*, as follows.

sub F5

E10

45. A router, comprising:

a plurality of processing engines for processing packets;

an interface for receiving a received packet from a network;

a data compiler to perform a hash function on said received packet to generate a hash result, and to select a selected processing engine from said plurality of processing engines in response to said hash result; and,

a switch to distribute said packet to said selected processing engine.

SUB I'

46. The router as in claim 45 further comprising:

said data compiler selection of said processing engine is partly table driven.

47. The router as in claim 45 further comprising:

said data compiler distributes the packets evenly among said plurality of processing engines.

CONT E'D

48. The router as in claim 45 further comprising:

said hash function uses a source address information.

49. The router as in claim 45 further comprising:

said hash function uses a destination address information.

50. The router as in claim 45 further comprising:

said hash function uses a protocol information.

51. The router as in claim 45 further comprising:

said hash function uses a source port information.

SUB F'

52. The router as in claim 45 further comprising:

said data compiler determines an IP source address having source bytes and an IP destination address having destination bytes and a protocol byte, and performs said hash function by performing an exclusive OR (XOR) to said source bytes and said destination bytes and said protocol byte to generate said hash result as at least one output byte, said at

least one output byte to designate a flow to which said received packet belongs, and routing all packets having the same flow to a selected processing engine.

53. The router as in claim 45 further comprising:

said data compiler puts packets received from said network into packet digest form before transferring them to said switch.

54. The router as in claim 45, further comprising:

said switch receiving said received packet from said processing engine after said processing engine finishes processing said packet as a processed packet, and then said switch routing said processed packet to an interface to transmit said processed packet out to said network.

55. The router as in claim 45, further comprising:

said processing engine has a plurality of queues, said packet has classification information in a header, and said processing engine selects a queue of said plurality of queues in response to said classification information.

56. The router as in claim 55, further comprising:

said classification information indicates a priority of said packet.

57. The router as in claim 45, further comprising:

said processing engine performs routing of said packet.

58. The router as in claim 45, further comprising:

said processing engine performs tag application update on said packet.

59. The router as in claim 45, further comprising:

said processing engine performs filtering on said packet.

60. The router as in claim 45, further comprising:

said data compiler allocating said processing of packets to remaining processing engines in the event that a processor fails.

SUB F'

61. The router as in claim 45, further comprising:

said data compiler detecting that a particular packet requires specialized processing; and

said switch distributing said particular packet to a specialized processing engine to perform said specialized processing.

CONT

E' SUB I'

62. The router as in claim 61, further comprising:

said specialized processing is compression.

63. The router as in claim 61, further comprising:

said specialized processing is decompression.

64. The router as in claim 61, further comprising:

said specialized processing is encryption.

65. The router as in claim 61, further comprising:

said specialized processing is routing.

66. The router as in claim 45, further comprising:

said processing engine designates a high bandwidth uplink to receive said packet.

67. The router as in claim 45, further comprising:

said processing engine performs encryption on said packet.

68. The router as in claim 45, further comprising:

said processing engine performs decryption on said packet.

69. The router as in claim 45, further comprising:

said switch is a crossbar switch.

70. A router, comprising:

a plurality of processing engines for processing packets;

an interface for receiving a received packet from a network;

means for performing a hash function calculation on said received packet to produce a hash result; and,

means, responsive to said hash result, for switching said received packet to a processing engine selected from said plurality of processing engines for further processing of said received packet.

71. A method of processing packets in a router, comprising:

receiving a packet from a network;

performing a hash function calculation on said packet to produce a hash result; and,

switching, in response to said hash result, said packet to a processing engine of a plurality of processing engines in said router, for further processing of said packet.

72. The method as in claim 71, further comprising:

selecting a processing engine by using said hash result and a table.

73. The method as in claim 71, further comprising:

distributing the packets evenly among said plurality of processing engines.

74. The method as in claim 71 further comprising:

using a source address information in said hash function calculation.

75. The method as in claim 71 further comprising:

using a destination address information in said hash function calculation.

76. The method as in claim 71 further comprising:

using a protocol information in said hash function calculation.

77. The method as in claim 71 further comprising:

using a source port information in said hash function calculation.

78. The method as in claim 71 further comprising:

performing an exclusive OR (XOR) in response to a source address and a destination address and a protocol byte to generate said hash result as at least one output byte, said at least one output byte to designate a flow to which said received packet belongs, and routing all packets having the same flow to a selected processing engine.

79. The method as in claim 71 further comprising:

allocating said packets to remaining processing engines in the event that a processing engine fails.

80. The method as in claim 71 further comprising:

detecting that a particular packet requires specialized processing; and

distributing said particular packet to a specialized processing engine to perform said specialized processing.

81. The method as in claim 80 further comprising:

processing compression as said specialized processing.

Sub H'

82. The router as in claim 80, further comprising:

processing decompression as said specialized processing.

83. The router as in claim 80, further comprising:

processing encryption as said specialized processing.

84. The router as in claim 80, further comprising:

processing routing as said specialized processing.

Cont E'10 Sub F'12

85. A router, comprising:

a plurality of processing engines for processing packets;

an interface for receiving a received packet from a network;

a data compiler to determine a type of service required by a received packet; and,

a switch, responsive to said type of service, to distribute said packet to a selected processing engine, said selected processing engine providing said type of service.

Sub I'

86. The apparatus as in claim 85 further comprising:

said type of service is compression.

87. The apparatus as in claim 85, further comprising:

said type of service is decompression.

88. The router as in claim 85, further comprising:

said type of service is encryption.

89. The router as in claim 85, further comprising:

said type of service is routing.

Sub F'13

90. A method of processing packets in a router, comprising:

receiving a packet from a network;

determining the type of service required by a received packet; and,

distributing, in response to said type of service, said received packet to a selected processing engine, said selected processing engine providing said type of service.

91. The method as in claim 90 further comprising:

processing compression as said type of service.

92. The router as in claim 90, further comprising:

processing decompression as said type of service.

93. The router as in claim 90, further comprising:

processing encryption as said type of service.

94. The router as in claim 90, further comprising:

processing routing as said type of service.

95. A computer readable media, comprising:

said computer readable media containing instructions for execution in a processor for the practice of the method of claim 17 or claim 71 or claim 90.

96. Electromagnetic signals propagating on a computer network, comprising:

said electromagnetic signals carrying instructions for execution on a processor for the practice of the method of claim 17 or claim 71 or claim 90.